

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-31 (cancelled)

Claim 32 (new): Synthetic resin dispersions for the production of hydrophilic sheet-like structures or hydrophilic shaped articles provided with hydrophobic surfaces, wherein the synthetic resin dispersions comprise

- a) an aqueous phase of solutions of hydrophilic melamine resin precondensates and latent curing catalysts in water or in mixtures of water and C₁-C₆-alcohols and
- b) an organic nanophase in the form of at least one of nanodroplets and nanoparticles of 70 to 99 % by weight of water-insoluble etherified melamine resin precondensates which contain acid curing catalysts and hydrophobizing agents and
- c) dispersing agents in a concentration of 1 to 10 % by weight, based on the total weight of the melamine resin precondensates, wherein

the ratio of hydrophilic melamine resin precondensates to water-insoluble etherified melamine resin precondensates in the synthetic resin dispersions is from 10:1 to 1:10 and the water content of the synthetic resin dispersions is from 8 to 50 % by weight.

Claim 33 (new): The synthetic resin dispersions according to claim 32, further comprising at least one of 0.1 to 5 % by weight of pigments based on the total weight of the melamine resin precondensates and 0.1 to 5 % by weight of flameproofing agents based on the total weight of the melamine resin precondensates.

Claim 34 (new): The synthetic resin dispersions according to claim 32, wherein the melamine resin precondensates in the aqueous phase and in the organic phase contain melamine and formaldehyde.

Claim 35 (new): The synthetic resin dispersions according to claim 32, wherein the concentration of the curing catalysts is 0.05 to 3 % by weight, based on the melamine resin precondensates.

Claim 36 (new): The synthetic resin dispersions according to claim 34, wherein the molar ratio of formaldehyde component / melamine component in the hydrophilic melamine resin precondensates is 1.6 : 1 to 4.5 : 1 and the concentration of the hydrophilic melamine resin precondensates in the aqueous phase is 10 to 50 % by weight.

Claim 37 (new): The synthetic resin dispersions according to claim 32, wherein the hydrophilic melamine resin precondensates are at least one of melamine resin precondensates partly etherified with C₁-C₄-alcohols and non-etherified melamine resin precondensates and wherein the mixing ratio in the mixtures of water and C₁-C₆-alcohols is 95 : 5 to 5 : 95.

Claim 38 (new): The synthetic resin dispersions according to claim 37, wherein the content of hydroxyl groups which are not etherified with C₁-C₄-alcohols in the melamine resin precondensates partly etherified with C₁-C₄-alcohols is 5 to 75 mol%, based on the sum of hydroxyl groups and C₁-C₄-alkoxy groups in the melamine resin precondensates partly etherified with C₁-C₄-alcohols.

Claim 39 (new): The synthetic resin dispersions according to claim 32, wherein the aqueous phase further comprises 1 to 20% by weight at least one of water-soluble polymers and water-soluble polyhydric alcohols with molecular weights of 62 to 5,000, based on the hydrophilic melamine resin precondensates.

Claim 40 (new): The synthetic resin dispersions according to claim 32, wherein the water-insoluble etherified melamine resin precondensates are melamine resin precondensates completely etherified with at least one of C₁-C₄-alcohols, C₂-C₂₀-diols and polyalkylene oxides with molecular weights of 250 to 5,000 and at least one of melamine resin precondensates partly etherified with C₅-C₁₈-alcohols, C₂-C₂₀-diols and polyalkylene oxides with molecular weights of 250 to 5,000.

Claim 41 (new): The synthetic resin dispersions according to claim 34, wherein the molar ratio of formaldehyde component / melamine component in the water-insoluble etherified melamine resin precondensates is 3 : 1 to 6 : 1 and wherein the average diameter of the nanodroplets or nanoparticles is 50 to 300 nm.

Claim 42 (new): The synthetic resin dispersions according to claim 32, wherein the organic nanophase comprises 0.1 to 2 % by weight of stabilizers, and at least one of 1 to 20 % by weight of water-insoluble polyhydric alcohols with molecular weights of 134 to 5,000 and/or 1 to 30 % by weight of laminar silicates, and wherein each weight is based on the water-insoluble etherified melamine resin precondensates.

Claim 43 (new): The synthetic resin dispersions according to claim 32, wherein the hydrophobizing agents are organic silicon compounds selected from the group consisting of organosilanols, organosiloxanes, organosilanes, organoaminosilanes, polyorganosiloxanes terminated with amino end groups or hydroxyl end groups, surface-fluorinated SiO₂ nanoparticles, polytetrafluoroethylene nanoparticles, and ethylenically unsaturated C₄-C₂₀-dicarboxylic acid anhydride copolymers containing imide groups.

Claim 44 (new): The synthetic resin dispersions according to claim 32, wherein the dispersing agents are nonionic dispersing agents or mixtures of 50 to 99% by weight of nonionic dispersing agents and 1 to 50 % by weight of anionic dispersing agents.

Claim 45 (new): The synthetic resin dispersions according to claim 32, wherein the dispersing agents are etherified melamine resin oligomers with molecular weights of 2,000 to 30,000.

Claim 46 (new): The synthetic resin dispersions according to claim 45, wherein the etherified melamine resin oligomers are melamine resin oligomers etherified with at least one of polyethylene glycols with molecular weights of 1,000 to 8,000 and C₁-C₁₂-monoalkyl-etherified polyethylene glycols with molecular weights of 1,000 to 8,500 and C₁-C₁₀ alcohols.

Claim 47 (new): The synthetic resin dispersions according to claim 46, wherein the molar ratio of polyethylene glycol / C₁-C₁₀ alcohol is 1 : 10 to 2 : 1 and the molar ratio of melamine / formaldehyde / etherifying alcohol is 1 : 2.8 : 2.5 to 1 : 4.5 : 3.5.

Claim 48 (new): The synthetic resin dispersions according to claim 32, wherein the hydrophilic sheet-like structures are laminates, pressed laminates or sheet-like carrier materials comprising at least one of cellulose, such as paper or wood, and polar plastics selected from the group consisting of polyamide, polyester, and polyvinyl acetate, and polyvinyl alcohol.

Claim 49 (new): The synthetic resin dispersions according to claim 32, wherein the hydrophilic shaped articles are timber products, or semi-finished products or moulded materials produced by thermoplastic processing of at least one of polar plastics selected from the group consisting of polyamide, polyester, and polyvinyl acetate, and polyvinyl alcohol or by processing of blends of 55 to 90 % by weight of wood and 45 to 10 % by weight of at least one of thermoplastics and thermosetting plastics.

Claim 50 (new): The synthetic resin dispersions according to claim 32, wherein the latent curing catalysts contained in the aqueous phase are at least one of ammonium salts, such as methylammonium phthalate or methylammonium maleate, the methylamine salt of naphthalenesulphonic acid, esters of phosphoric acid, phosphorous acid, oxalic acid or phthalic acid, such as diethyl phosphate, oxalic acid dimethyl ester or phthalic acid dimethyl ester.

Claim 51 (new): The synthetic resin dispersions according to claim 32, wherein

at a molar ratio of formaldehyde component/melamine component up to 4 : 1, blocked sulphonic acids, aliphatic C₄-C₁₈-carboxylic acids, alkali metal salts or ammonium salts of phosphoric acid, C₁-C₁₂-alkyl esters or C₂-C₈-hydroxyalkyl esters of C₆-C₁₄-aromatic carboxylic acids or inorganic acids, salts of melamine or guanamines with C₁-C₁₈-aliphatic carboxylic acids, anhydrides, half-esters or half-amides of C₄-C₂₀-dicarboxylic acids, half-

esters or half-amides of copolymers of ethylenically unsaturated C₄-C₂₀-dicarboxylic acid anhydrides and ethylenically unsaturated monomers of the type of at least one of C₂-C₂₀-olefins and C₈-C₂₀-vinylaromatics, at least one of (meth)acrylic acid copolymers and salts of C₁-C₁₂-alkylamines or alkanolamines with C₁-C₁₈-aliphatic, C₆-C₁₄-aromatic or alkylaromatic carboxylic acids or inorganic acids of the type of hydrochloric acid, sulphuric acid or phosphoric acid, or

at a molar ratio above 4 : 1, at least one of strong acids, such as hydrochloric acid, sulphuric acid, phosphoric acid, p-toluenesulphonic acid, methanesulphonic acid, dodecylbenzenesulphonic acid, dinonylnaphthalenesulphonic acid and dinonylnaphthalenedisulphonic acid are employed as acid curing catalysts in the water-insoluble melamine resin precondensates.

Claim 52 (new): The synthetic resin dispersions according to claim 44, wherein the nonionic dispersing agents are at least one of ethylene oxide/propylene oxide block copolymers, poly(C₂-C₄-alkylene) oxides monoetherified with C₈-C₁₈-alcohols, esters of polyhydric alcohols with C₈-C₁₈-carboxylic acids, C₂-C₄-alkylene oxide adducts on C₈-C₁₈-fatty alcohols and copolymers of ethylenically unsaturated C₄-C₂₀-dicarboxylic acid anhydrides and ethylenically unsaturated monomers of the type of C₂-C₂₀-olefins, C₈-C₂₀-vinylaromatics, C₄-C₂₁-acrylic acid esters and C₅-C₂₂-methacrylic acid esters, which have been imidized with poly(C₂-C₄-alkylene) oxides terminated by amino groups.

Claim 53 (new): The synthetic resin dispersions according to claim 44, wherein the anionic dispersing agents are at least one of alkali metal salts of (meth)acrylic acid copolymers, salts of oxyethylated C₆-C₁₈-alkylphenol-sulphates and alkali metal and at least one of ammonium salts of C₈-C₁₈-carboxylic acids and C₈-C₁₈-alkylsulphonates.

Claim 54 (new): A process for the preparation of synthetic resin dispersions according to claim 32, comprising a multi-stage process in which

in a first process stage mixtures of hydrophilic melamine resin precondensates, water-insoluble melamine resin precondensates and hydrophobizing agents are homogenized as highly viscous liquids or melts at 50 to 130°C over residence times of 2 to 15 minutes; and

in a second process stage the mixtures are introduced at high shear rates over residence times of 3 minutes to 15 minutes into 8.7 to 100 % by weight, based on the sum of the melamine resin precondensates, of water which contains 0.5 to 10 % by weight, based on the sum of the melamine resin precondensates, of dispersing agents; and the dispersions are cooled to room temperature at low shear rates, with further stirring, latent curing agents and acid curing catalysts being added after the cooling to room temperature.

Claim 55 (new): The process for the preparation of synthetic resin dispersions according to claim 54, wherein the water in the second process stage contains 1 to 25 % by weight, based on the total weight of the melamine resin precondensates, of C₃-C₆-alcohols as dispersing auxiliaries and water-soluble polymers alcohols or both and is heated to temperatures up to 90°C, and wherein at least one of pigments and flameproofing agents are added after the cooling to room temperature.

Claim 56 (new): The process for the preparation of synthetic resin dispersions according to claim 32, comprising a multi-stage process in which

in a first process stage water-insoluble melamine resin precondensates are introduced as highly viscous liquids or melts at 50 to 130°C at high shear rates over residence times of 3 minutes to 15 minutes into 8.7 to 100 % by weight, based on the water-insoluble melamine resin precondensates, of water which contains 0.5 to 10 % by weight, based on the water-insoluble melamine resin precondensates, of dispersing agents and the dispersions are cooled to room temperature at low shear rates, with further stirring; and

in a second process stage hydrophilic melamine resin precondensates are added as solutions to the aqueous dispersion of the water-insoluble melamine resin precondensates; and the mixture is homogenized, latent curing agents and acid curing catalysts being added to the aqueous solutions.

Claim 57 (new): The process for the preparation of synthetic resin dispersions according to claim 56, wherein at least one of the water-insoluble melamine resin precondensates in the first process stage and the aqueous solutions of the second process stage contain up to 30 % by weight of hydrophobizing agent and the water in the first process

stage contains 1 to 25 % by weight, based on the water-insoluble melamine resin precondensates, at least one of C₃-C₆-alcohols as dispersing auxiliaries and water-soluble polymers and water-soluble polyhydric alcohols and is heated to temperatures up to 90°C, and in that pigments or flameproofing agents or both are added to the aqueous solutions of the second process stage.

Claim 58 (new): The process for the preparation of synthetic resin dispersions according to claim 32, comprising a multi-stage process in which

in a first process stage melamine resins etherified with C₁-C₁₀-alcohols are reacted, in the presence or in the absence of acid curing catalysts, with polyethylene glycols with molecular weights of 500 to 8,000 at temperatures of 50 to 165°C to give etherified melamine resin oligomers,

in a second process stage, at temperatures of 60 to 200°C, mixtures of 15 to 40 % by weight of etherified melamine resin oligomers and 85 to 60 % by weight of melamine resins etherified with C₁-C₁₀-alcohols and with molecular weights of 300 to 800 are introduced at a high shear gradient into water, which is preheated to 20 to 80°C, 0 to 8 % by weight of hydrophobizing agent being added to the melt of etherified melamine resin oligomers and melamine resins etherified with C₁-C₁₀-alcohols and/or the aqueous phase in the second process stage, after which

in a third process stage 10 to 40 % by weight of hydrophilic melamine resin precondensates are mixed in the form of a 30 to 70 % strength aqueous solution with 90 to 60 % by weight of the mixture of melamine resin oligomers and etherified melamine resins of the second process stage.

Claim 59 (new): Hydrophilic sheet-like structures or hydrophilic shaped articles provided with hydrophobic surfaces, produced using synthetic resin dispersions according to claim 32.

Claim 60 (new): Hydrophilic sheet-like structures or hydrophilic shaped articles provided with hydrophobic surfaces, according to claim 59, wherein the thickness of the hydrophobic surfaces is 1 to 40 µm.

Claim 61 (new): Hydrophilic sheet-like structures or hydrophilic shaped articles provided with hydrophobic surfaces, according to claim 59, wherein for production of the hydrophobic surfaces, the synthetic resin dispersions are applied to the hydrophilic sheet-like structures, excluding laminates, or hydrophilic shaped articles by spraying on after preheating of the hydrophilic sheet-like structures or hydrophilic shaped articles to 50 to 95°C, and the sheet-like structures or shaped articles impregnated with the synthetic resin dispersions are dried and cured at 100 to 145°C.

Claim 62 (new): An article coated with the synthetic resin dispersions of claim 32.